

Co-variability of the Strait of Georgia and the northeast Pacific Ocean on climatic time scales

Patrick Cummins, Diane Masson, Institute of Ocean Sciences*

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A 35 year record of bimonthly vertical temperature profiles from the deep central Strait of Georgia is examined. Decomposition of the variability into empirical orthogonal modes shows that the dominant mode, accounting for over 70% of the variance, has its maximum amplitude at mid-depth in the water column. Amplitudes decrease towards the bottom, and more markedly towards the surface. The principal component (PC1), or time series, associated with this mode is dominated by long period fluctuations on interannual to decadal time scales. PC1 clearly shows the recent cool episode of 1999-2002 and the subsequent warming of 2003. These results from the Strait of Georgia are compared with subsurface observations from Line P in the northeast Pacific. A close correspondence is found between the major warming/cooling episodes occurring offshore with those observed in the Strait. The main exception is the remarkably strong cold anomaly of 1979 which appears to have been locally forced. Apart from this, the comparison indicates that on interannual to decadal time scales, conditions in the Strait co-vary with large scale northeast Pacific anomalies. It is suggested that the response to wind forcing over the ocean interior is an important mechanism driving this variability.